

PERSONAL DETAILS

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NATIONALITY: Zimbabwean
NATIONAL IDENTITY #: 22-114402-S-22
PASSPORT NUMBER: BN 730410
SEX: Male
MARITAL STATUS: Married
NUMBER OF CHILDREN: Three
DATE OF BIRTH: 27/09/69

ACADEMIC QUALIFICATIONS

1. LICENCIATE IN EDUCATION (PHYSICS AND ASTRONOMY),
Degree class: Gold Seal
2. BACHELOR OF SCIENCE (Special Honours in Physics)
Degree class: 2.1
3. MASTER OF PHILOSOPHY (LASERS AND APPLIED OPTICS)

UNIVERSITIES ATTENDED

- **NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**
DURATION: 2002-2006
QUALIFICATION OBTAINED: Master of Philosophy
THESIS TITLE: Design, fabrication and characterization of locally made CO₂ gas laser
- **UNIVERSITY OF ZIMBABWE**
DURATION: 1999-2000
QUALIFICATION OBTAINED: B. Sc. Physics (Hons.)
- **INSTITUTO SUPERIOR PEDAGOGICO "ENRIQUE JOSE VARONA", HAVANA, CUBA.**
DURATION: FROM 1988 TO 1993
QUALIFICATION OBTAINED: LICENCIATE IN EDUCATION IN THE SPECIALITY OF PHYSICS
AND ASTRONOMY.
PRIZES AWARDED: BEST GRADUATE IN PHYSICS OF (1988-1993)
BEST 3RD YEAR PHYSICS STUDENT (1988-1989)
BEST 2ND YEAR PHYSICS STUDENT (1987-1988)

WORKING EXPERIENCE

NAME OF EMPLOYER: MINISTRY OF EDUCATION AND CULTURE
(GOKOMERE HIGH SCHOOL, MASVINGO REGION, ZIMBABWE)

OCCUPATION & DURATION: TEACHER (FROM SEPTEMBER 1993 TO 2001)

SUBJECTS TAUGHT & PERIOD: - A-LEVEL PHYSICS (1993 TO 2001)
A-LEVEL COMPUTING (1996 TO 2001)
O-LEVEL SCIENCE (1993 TO 1997)

POSTS OF SPECIAL RESPONSIBILITIES

- ◆ HEAD OF DEPARTMENT OF SCIENCE (1996 - 2001)
- ◆ CHAIRMAN OF MASVINGO A-LEVEL PHYSICS TEACHERS' ASSOCIATION (1995 -1999)
- ◆ PATRON AND CHAIRMAN OF GOKOMERE PHYSICS CLUB (1991 - 1998)
- ◆ VICE SPORTSMATER OF GOKOMERE HIGH (1995 –1998)
- ◆ CHAIRMAN OF MASVINGO SCHOOLS BASKETBALL ASSOCIATION (1995 –1999)
- ◆ NATIONAL UNDER 16 BOYS BASKETBALL COACH (1995 – 1997)

NAME OF EMPLOYER: MINISTRY OF HIGHER EDUCATION AND TECHNOLOGY
(MORGENSTER TEACHERS' COLLEGE, MASVINGO)

OCCUPATION & DURATION: LECTURER (FROM NOVEMBER 2001 TO AUGUST 2002)
SUBJECTS TAUGHT & PERIOD: - ENVIRONMENTAL SCIENCE (FROM NOVEMBER 2001 TO AUGUST 2002)
 PROFESSIONAL STUDIES (FROM NOVEMBER 2001 TO AUGUST 2002)

NAME OF EMPLOYER: SCIENTIFIC INDUSTRIAL RESEARCH AND DEVELOPMENT CENTER

OCCUPATION & DURATION: Staff Development Fellow (From August 2002 to August 2004)
JOB DESCRIPTION: Pursue an M. Phil Degree at NUST. Through the M. Phil. project built a Carbon dioxide laser and a switched mode power supply to pump the laser. Develop electronic circuits with the group in the Electronics Institute.

NAME OF EMPLOYER: NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY (NUST)

OCCUPATION & DURATION: Teaching Assistant in Applied Physics Department (From September 2004 to July 2006)

JOB DESCRIPTION:

- Supervise First and Second Year Physics laboratories.
- Mark assignments and tests as designated by lecturers in the department.
- Pursue postgraduate studies by research and graduate with a Master of Philosophy Degree.

OCCUPATION & DURATION: Lecturer in Applied Physics Department (From July 2006 to date)

JOB DESCRIPTION:

- Teach undergraduate Physics courses to First Year, Second Year and Fourth Year students. Courses taught include Mechanics, Analogue Electronics, Digital Electronics, Nuclear Physics and Electromagnetism.
- Supervisor Second Year Analogue and Digital Electronics laboratories.
- Set and mark examinations for the courses taught.
- Attend all Faculty and Departmental Board meetings.
- Act as the Department chairperson in the absence of the Chairman
- Participate on the Zimbabwe International Trade Fair on behalf of the University as part of the community service.
- Conduct research in my field of specialization viz (Laser and Applied Optics)
- Pursue PhD studies as a part time student and on split site basis in collaboration with the Laser Research Institute, University of Stellenbosch.

NAME OF EMPLOYER: CSIR-NATIONAL LASER CENTRE,

OCCUPATION & DURATION: Visiting Researcher (October 2008 to April 2009)

JOB DESCRIPTION:

- Do research work on femtosecond laser micromachining. This involved setting up of the micromachining workstation in the femtosecond laser laboratory as well as carry out experiments to investigate optimum parameter for microhole drilling and machining.
- Using the Nd:YAG ablator during machining of jobs. This involved mounting of jobs on the DML-400 ablation machine as well as operating the machine to ablate the workpieces using 1.06 μm laser pulses.

Current Studies

I am a registered PhD student at the National University of Science and Technology (NUST), Bulawayo in Zimbabwe, under a sandwich programme with Stellenbosch University. My project title is "*Development of novel discharge excitation schemes and switching technology for small CO₂ TEA and excimer lamps and their application to materials processing*". During the course of the project I will be at my university half the period and be working at the Laser research Institute of Stellenbosch the other half of the time. My Supervisors are Prof. von Bergmann of LRI, Stellenbosch University and Dr. D. J. Hlatywayo of NUST.

Experience with Lasers

I have made a longitudinally excited CW CO₂ gas laser which I have characterized. During my visit to Stellenbosch University I had the opportunity of working with high power and medium power transversely excited CO₂ lasers. I have also worked with dye lasers, solid state lasers as well as diode lasers. I have also participated in the use of lasers to produce holograms. I have done ablation and microhole drilling of brass, stainless steel and the medical catheter using femtosecond laser at the CSIR. Using the same laser, I was also able to dot matrix print on human hair (100 μm in diameter) the letters "NLC".

MSc. Lasers and Applied Optics

Apart from working on my M. Phil project, I have also been attending lectures for the MSc. Lasers and Applied Optics Degree Programme which was offered by NUST's Applied Physics Department. I have sat for exams for the courses that I attended during the two years that the course was offered and have been given a department transcript since I was not registered as a student on the programme.

International Training Courses attended

1. Basic laser course: Organised by the African Laser Center in conjunction with the Laser Research Institute of Stellenbosch University in February 2005.
2. Basic laser Safety course: Organised by the National Laser center of South Africa in conjunction with the Laser Research Institute of Stellenbosch University in June 2005.
3. Entrepreneurship for Physicists and Engineers from Developing Countries, 17 to 21 March 2008, ICTP, Trieste, Italy.

Workshops and Conferences attended

1. International workshop on application of lasers and conference on lasers and optics which was held in Windhoek Namibia as from 12 August 2003 to 17 August 2004.
2. International conference on appropriate technology held organized by The National University of Science and Technology and was held at the Bulawayo Rainbow hotel as from the 15th to the 17th of July 2004. Biophotonics workshop held at Stellenbosch University in May 2005.
4. 2nd International conference on appropriate technology organized by The National University of Science and Technology and was held at the Bulawayo Rainbow Hotel as from 12th to 15 July 2006
5. 6th Edward Bouchet and Abdus Salam International (EBASI) Conference Physics and Technology for Sustainable Development for Africa, iThemba Labs, the Western Cape, South Africa from 24 - 26 January 2007.
6. The 52nd South African Institute of Physicists Conference held at University of Witwatersrand, Johannesburg, South Africa, 2 – 5 July 2007.
7. The International Topical Meeting and Workshop on Optics and Laser Applications in Medicine and Environmental Monitoring for Sustainable Development held at University of Cape Coast, Ghana from 19-24 November, 2007.
8. African Laser Center – Kariega 2008 Symposium, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, 7-9 May 2008.

9. The first International conference on Laser and Plasma Applications in Materials Science (LAPAMS' 08), hosted by Centre de Developpement des Technologies Avancees, Algiers, Alageria, 23rd to 26th June 2008.
10. 53rd South African Institute of Physicists Conference held at University of Limpopo, Polokwane, South Africa, 9 – 11 July 2008.
11. The third TWAS-ROSSA Young Scientists in Africa conference on “Alternative sources of energy: Potential for renewable energy and biofuels in Africa”, held at Hilton hotel, Nairobi, Kenya, 15 – 17 December 2008

Presented Papers At International Conferences And Workshops

1. *Design and development of a CO₂ gas laser and pumping system for industrial and research applications.* This paper was presented at the International workshop on application of lasers and conference on lasers and optics which was held in Windhoek Namibia as from 12 August 2003 to 17 August 2004.
2. *Nitrogen gas laser: A tool for building confidence in students studying in developing countries.* I am a co-author of this paper and was presented at the International conference on appropriate technology organized by The National University of Science and Technology and was held at the Bulawayo Rainbow hotel as from the 15th to the 17th of July 2004. *Design, development and characterisation of a CO₂ gas laser system for medical and research applications.* This paper was presented at the 2nd International conference on appropriate technology organized by The National University of Science and Technology and was held at the Bulawayo Rainbow Hotel as from 12th to 15 July 2006.
4. *Experimental study of design parameters of longitudinally excited CO₂, TEA CO₂ lasers and of dielectric barrier discharges as the excitation mechanisms for TEA CO₂ lasers.* This paper was presented at 52nd South African Institute of Physicists Conference held at University of Witwatersrand, Johannesburg, South Africa, 2 – 5 July 2007
5. *Experimental study of design parameters of dielectric barrier discharges as the excitation mechanism for compact TEA CO₂ lasers to be used for medical and environmental applications.* This paper was presented at the OPTOLASERMED2007, University of Cape Coast, Ghana, 19 – 24 November 2007.
6. *Experimental investigation of factors influencing spatial distribution of micro-discharges in non-thermal plasmas.* This paper was presented at the African Laser Center – Kariaga 2008 Symposium, Nelson Mandela metropolitan University, Port Elizabeth, South Africa, 7-9 May 2008.
7. *Experimental investigation of factors influencing spatial distribution of micro-discharges in non-thermal plasmas.* This paper was presented at the 53rd SAIP conference, hosted by the University of Limpopo, Polokwane, South Africa as from 9th to 11 July 2008.

Posters Presented at International Conferences

1. *Design, development and characterization of a longitudinally excited CO₂ gas laser system for medical and research applications.* This poster was presented at the 6th Edward Bouchet and Abdus Salam (EBASI) International Conference Physics and Technology for Sustainable Development for Africa, iThemba Labs, the Western Cape, South Africa from 24 - 26 January 2007.
2. *Experimental investigation of factors influencing spatial distribution of micro-discharges in non-thermal plasmas.* Poster presented at the First International Conference on Laser and Plasma applications in Materials Science, Centre de Developpement des Technologies Avances, Algiers, Algeria, 23rd -26th June 2008.

Publications

1. *Design, development and characterisation of a CO₂ gas laser system.* This paper has been accepted for publication by the Journal of Applied Sciences for Southern Africa (JASSA) and was due for publication in Volume 12, issue one of 2006.

REFEREES

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